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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/534,644

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Tsuyoshi Suda

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SANTA MONICA, CA 90404

EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1724

NOTIFICATION DATE

DELIVERY MODE

12/02/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/534,644	Applicant(s) SUDA ET AL.	
	Examiner KAJ K. OLSEN	Art Unit 1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-18,21,22,24-36,40 and 41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 40 and 41 is/are allowed.
- 6) ☒ Claim(s) 1-4,6-18,21,22 and 24-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The previous 112 rejection of claim 20 has been withdrawn in view of the cancelling of that claim.

Claim Rejections - 35 USC § 102

2. The previous 102 rejection of claim 20 has been withdrawn in view of the cancelling of that claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1-4, 6, 9, 18, 21, 22, 24, 27, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi (US 2003/0024813) (hereafter “Taniguchi ‘813”) in view of Nakamura et al (USP 4,024,036).

6. With respect to claims 1 and 2, Taniguchi ‘813 discloses a hydrogen sensor comprising first and second electrodes 31 and 32 and an electrolyte 11 where the first and second electrodes are made of different materials (par. 0077 and 0078) and that these different materials would inherently have different chemical potentials or absorption-dissociation properties towards hydrogen gas. In particular, Taniguchi ‘813 discloses that one of the electrodes can be an Al or an Al alloy while the other electrode can be a material like Pt or Pd (par. 0077). These choice of materials of Taniguchi ‘813 overlap the claimed materials of claims 4 and 22. The hydrogen gas detection of Taniguchi ‘813 is based on an electromotive force (fig. 7B and par. 0078).

Taniguchi ‘813 does not explicitly disclose the use of a phosphorus tungsten or molybdenum acid. However, Nakamura discloses that both phosphorus tungsten and molybdenum acids are known proton electrolytes for hydrogen sensors. See abstract; col. 1, ll. 7-12; and col. 4, l. 54 - col. 5, l. 1. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Nakamura for the electrolyte of Taniguchi ‘813 because the substitution of one known proton selective electrolyte for another requires only routine skill in the art.

7. With respect to the new limitation of claims 1 and 2 about the electrolyte also having a reinforcing material, Nakamura discloses that the electrolyte can also contain small amounts of ethylene tetrafluoride powder that improves the bending strength of the electrolyte (col. 6, ll. 18-57). Hence, this additional powder would constitute a reinforcing material.

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8. With respect to claims 3 and 21, because the materials of Taniguchi '813 overlap those the present invention (compare par. 0077 with claims 4 and 22), the electrodes of Taniguchi '813 would inherently have these properties.

9. With respect to claims 4 and 22, see par. 0077 and the discussion of claims 1 and 2 above.

10. With respect to claims 6 and 44, Nakamura also teaches that the two electrodes of a gas sensor can be on opposite sides of an electrolyte (fig. 5).

11. With respect to claims 9 and 27, see par. 0051 of Taniguchi '813 and col. 12, ll. 3-27 of Nakamura.

12. With respect to claims 18 and 36, see fig. 8 and par. 0078 and 0080 of Taniguchi '813. As to par. 0080 stating that fig. 8 is showing the current flowing, fig. 8 clearly shows that the signal is an electromotive force (i.e. voltage) and not a current as in fig. 6. See also par. 0078 where Taniguchi '813 clearly stated that the measured signal for the embodiment 3 of fig. 7B and 8 is an electromotive force sensor. Hence, Taniguchi '813's discussion of current in par. 0080 would appear to be a misprint.

13. Claims 7 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above, and further in view of Makundan et al (US 6,656,336).

14. With respect to the claims, Taniguchi '813 and Nakamura disclose all the limitations of the claims, but Taniguchi '813 does not appear to expressly disclose that the electrodes may be arranged as rods on a substrate with an electrolyte disposed in between. However, Makundan discloses Figure 1B, a hydrocarbon sensor in which two electrodes 12 and 16 are disposed on an

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electrolyte 10. Electrode 16 is obvious in the shape of a rod. At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrodes of Taniguchi '813 to be rods as those of Makundan because the positioning of the electrodes yields no significant functional difference and are therefore are a matter of obvious engineering choice. Although only one electrode in Makundan is actually shaped like a rod, one of ordinary skill in the art would not have difficulty discerning that the other electrode could be fashioned in the similar manner.

15. Claims 8 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above, and further in view of Sugiyama et al (US 4,704,536).

16. With respect to the claims, Taniguchi '813 and Nakamura disclose all the limitations of the claims, but does not appear to expressly disclose that the electrodes may be arranged as concentric cylinders. However, Sugiyama discloses figure 9, a gas sensor with two co-axial electrodes 23 and 24 configured as concentric cylinders. At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the gas sensor configuration of Taniguchi '813 with the concentric, cylindrical electrodes in Sugiyama because the positioning of the electrodes yields no significant functional difference, and therefore concentric cylindrical electrodes are a matter of an obvious engineering choice.

17. Claims 10 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 2 and 9 above, and in further view of Yun et al (WO 01/89021) (hereafter "WO '021").

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18. With respect to the claims, Taniguchi '813 and Nakamura disclose all the limitations of claim 9. Taniguchi '109 does not appear to expressly disclose the electrolyte comprise an internal scaffold of a material such as glass wool. However, WO '021 discloses in the abstract an electrolyte in which contains an electrospun matrix of polymeric, electrolytic material into which lithium salt-dissolved organic electrolytes are incorporated. One of the advantages of this construction as outlined by WO '021 is a "good mechanical strength." At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the electrolyte of Taniguchi '813 and Nakamura with an internal matrix like WO '021 because one would wish to take advantage of the improved mechanical strength such a construction would offer.

19. Claims 11-16 and 29-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above, and further in view of Christen et al (USP 4,390,869).

20. With respect to claims 11-13 and 29-31, Taniguchi '813 and Nakamura teach a hydrocarbon sensor with all the limitations of claims 1 and 2. The preambles for each claim (e.g. "a hydrogen gas leak controlling system" or "a hydrogen gas leak information transmitting system," etc.) are not structurally limiting and have not been given patentable weight. Taniguchi '813 does not expressly teach that a voltage comparator be used in the apparatus. However, Christen teaches a gas sensing signaling system. In particular, Christen teaches figure 7 which includes three comparators 101/1, 101/2, 101/3. These are voltage comparators (col. 12, lines 21-33). At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to include a voltage comparator like that from Christen in the apparatus of

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Taniguchi '813 because of the necessary advantages of doing so, such as eliminating false alarms or alarms for negligible concentrations of gas.

21. With respect to claims 14-16 and 32-34 (those limitations not covered above), Christen teaches the use of Schmitt triggers to distinguish between warning signals and alarm signals (col. 15, lines 32-43).

22. Claims 17 and 35 are rejected under 35 U.S.C 103(a) as being unpatentable over Taniguchi '813 in view of Nakamura as applied to claims 1 and 2 above in view of Maki et al (US 2004/0026268).

With respect to the claims, Taniguchi '813 and Nakamura teaches all the limitations of the claims, but does not expressly teach that there be a plurality of hydrogen gas sensors arranged on the same substrate. However, Maki teaches an apparatus which is an electromotive force type gas sensor comprising a substrate and a gas sensor on that substrate (Maki, claim 1). Further, Maki teaches a claim 8 drawn to an electromotive force gas sensor with two or more electromotive force gas sensors on the same substrate. At the time of the invention, it would have been *prima facie* obvious to those of ordinary skill in the art to provide a plurality of gas sensors like in Taniguchi '813 on the same substrate like in Maki because of the versatility such a configuration would have, such as the ability to allow for failure of some gas sensors without failure of the whole apparatus as well as the ability to possibly discern a target gas profile or concentration gradient.

Allowable Subject Matter

23. Claims 40 and 41 are allowed.

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24. The reasons for the allowance of claims 40 and 41 can be found in the 1/15/2010 office action and will not be reiterated here.

Response to Arguments

25. Applicant's arguments filed 10/6/2010 have been fully considered but they are not persuasive. Most of the arguments are a reiteration of the examiner's positions and would not appear to require further comment. Applicant's arguments that the relied on prior art does not teach the amended limitations of claims 1 and 2 is not persuasive for the reasons highlighted in the modified rejection above.

Conclusion

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1724

November 26, 2010